NAVAIR

NAVY TRAINING SYSTEM PLAN

FOR THE

JOINT PRECISION APPROACH

LANDING SYSTEM

N78-NTSP-A-50-0306/I

JANUARY 2004

JOINT PRECISION APPROACH LANDING SYSTEM

EXECUTIVE SUMMARY

The Joint Precision Approach Landing System (JPALS) is an all-weather, all-mission, all-user landing system based on a local area differential Global Positioning System and Inertial Navigation System (INS). The JPALS will allow equipped aircraft to land on any suitable surface worldwide (land or sea), while minimizing impacts to aircraft recovery operations due to low ceiling and/or visibility. The JPALS will provide a joint operational capability for United States forces to perform assigned conventional and special operations missions from fixed-base, tactical, shipboard, and special mission environments. The Air Force, Army, Navy, Marine Corps, and Coast Guard will employ JPALS. The Air Force has been designated as the lead service. JPALS is currently in the Concept and Technology Development phase of the Defense Acquisition System and is scheduled to reach Milestone B in December 2004.

The JPALS configuration used aboard aircraft carriers and large amphibious assault ships will be operated by Air Traffic Controllers (AC) with Navy Enlisted Classifications (NEC) 6902 and 6903. JPALS used aboard other type ships, tactical environments, and special mission scenarios will require no operator. No operator will be required for the fixed-base JPALS configuration.

It is anticipated that the JPALS will utilize two levels of maintenance, i.e. organizational and depot, based on the Condition Based Maintenance Concept. At this point in system development, the maintenance personnel required to maintain the JPALS fixed-base, tactical, shipboard, and special mission configurations have not been identified. The JPALS aircraft avionics systems will be maintained by the same maintenance technicians that currently maintain the aircraft's other avionics systems. JPALS depot level maintenance will be organic, commercial, or a combination of both.

Initial JPALS training will be provided by the contractor for Test and Evaluation team members, installation team members, and initial cadre personnel. Follow-on operator training for AC personnel with NECs 6902 and 6903 will be accomplished by modifying existing courses available at Naval Air Technical Training Center Pensacola, Florida. Existing aircraft avionics maintenance courses will be modified to include JPALS. Training requirements for other JPALS operators and maintainers will be identified by the contractor during the System Development and Demonstration phase.

Current manpower levels are adequate to support the JPALS with no change to the existing Navy and Marine Corps manpower requirements.

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LIST OF ACRONYMS

AATCC	Amphibious Air Traffic Control Center
AC	Air Traffic Controller
ACLS	Automatic Carrier Landing System
ADMACS	Aviation Data Management And Control System
AFB	Air Force Base
AFOTEC	Air Force Operational Test and Evaluation Center
APMTS	Assistant Program Manager, Training Systems
ARD	Architecture and Requirements Definition
ASPARCS	Air Surveillance and Precision Approach Radar Control System
ATC	Air Traffic Control
BFTT/AMN	Battle Force Tactical Trainer/Air Management Node
BIT	Built-In Test
CAD	Component Advanced Development
CAI	Computer-Aided Instruction
CAT	Category
CATCC	Carrier Air Traffic Control Center
CBM+	Condition Based Maintenance Plus
CBT	Computer-Based Training
CIN	Course Identification Number
CM	Corrective Maintenance
CMM	Course Model Manager
CNATT	Center for Naval Aviation Technical Training
CNO	Chief of Naval Operations
COMLANTFLT	Commander, Atlantic Fleet
COMNAVRESFOR	Commander, Naval Reserve Force
COMPACFLT	Commander, Pacific Fleet
COTS	Commercial Off-The-Shelf
CPT	Cockpit Procedures Trainer
CRAF	Civil Reserve Air Fleet
CTO	Control Tower Operator
CV	Aircraft Carrier
CVN	Aircraft Carrier, Nuclear
DAIR	Direct Altitude Identity Readout
DH	Decision Height
DL	Data Link
DoD	Department of Defense

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LIST OF ACRONYMS

DT	Developmental Test
DT&E	Developmental Test & Evaluation
ESC	Electronic Systems Center
ET	Electronics Technician
FAA	Federal Aviation Administration
FMS	Foreign Military Sales
FOC	Full Operational Capability
FY	Fiscal Year
GPS	Global Positioning System
HSI	Human Systems Integration
ICLS	Instrument Carrier Landing System
ICW	Interactive Courseware
IETM	Interactive Electronic Technical Manual
INS	Inertial Navigation System
IOC	Initial Operational Capability
IPT	Integrated Product Team
ISIS	Integrated Shipboard Information System
IT	Information System Technician
JPALS	Joint Precision Approach Landing System
JRB	Joint Reserve Base
JSF	Joint Strike Fighter
JTRS	Joint Tactical Radio System
J-UCAS	Joint-Unmanned Combat Air System
LDGPS	Local Differential Global Positioning System
LH	Amphibious Assault
MCCDC	Marine Corps Combat Development Center
MTBF	Mean Time Between Failures
MOS	Military Occupational Specialty
MRT	Mean Repair Time
MSD	Material Support Date
MPT	Manpower, Personnel, and Training

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LIST OF ACRONYMS

NA	Not Applicable
NAF	Naval Air Facility
NALF	Navy Auxiliary Landing Field
NAS	Naval Air Station
NATTC	Naval Air Technical Training Center
NAVAIR	Naval Air Systems Command
NAVPERSCOM	Naval Personnel Command
NDI	Non-Developmental Item
NEC	Navy Enlisted Classification
NETC	Naval Education and Training Command
NS	Naval Station
NSD	Navy Support Date
NTSP	Navy Training System Plan
OFT	Operational Flight Trainer
OPNAV	Office of the Chief of Naval Operations
OPO	OPNAV Principal Official
ORD	Operational Requirements Document
OT	Operational Test
OT&E	Operational Test and Evaluation
PA	Practical Application
PAR	Precision Approach Radar
PM	Preventive Maintenance
PMA	Program Manager, Air
RFOU	Ready For Operational Use
SDD	System Development and Demonstration
SE	Support Equipment
SERD	Support Equipment Recommendation Data
SM	Statute Mile
SM&R	Source, Maintenance, and Recoverability
SOF	Special Operations Force
SRGPS	Ship Relative Global Positioning System
SSD	Software Support Date
TACAN	Tactical Air Navigation
TBD	To Be Determined
TD	Training Device

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LIST OF ACRONYMS

TEMP	Test and Evaluation Master Plan
T/M/S	Type/Model/Series
TTE	Technical Training Equipment

JOINT PRECISION APPROACH LANDING SYSTEM

PREFACE

This is the second iteration of the Joint Precision Approach Landing System (JPALS) Initial Navy Training System Plan (NTSP) and updates the previous edition dated February 1999. This document explores the various employment and support alternatives currently under consideration. Since it is relatively early in the acquisition process, some definitive data was unavailable for inclusion in this version. This NTSP is a product of the Training Planning Process Methodology, as outlined in Office of the Chief of Naval Operations (OPNAV) Publication P-751-3-9-97.

This NTSP identifies only the Navy and Marine Corps Manpower, Personnel, and Training (MPT) concepts associated with the JPALS. It does not address other Department of Defense (DoD) JPALS recipients.

PART I - TECHNICAL PROGRAM DATA

A. NOMENCLATURE-TITLE-PROGRAM

1. **Nomenclature-Title-Acronym.** Joint Precision Approach Landing System (JPALS)

2. **Program Element.** 0603860F

B. SECURITY CLASSIFICATION

1. **System Characteristics** ..... Unclassified
2. **Capabilities** ..... Unclassified
3. **Functions** ..... Unclassified

C. MANPOWER, PERSONNEL, AND TRAINING PRINCIPALS

OPNAV Principal Official (OPO) Program Sponsor ..... CNO (N78)

OPO Resource Sponsor..... CNO (N78)

Developing Agency ..... NAVAIR (PMA213)

Training Agency ..... COMLANTFLT
COMPACFLT
CNATT
MCCDC
COMNAVRESFOR

Training Support Agency..... NAVAIR (PMA205)

Manpower and Personnel Mission Sponsor..... CNO (N12)
NAVPERSCOM (PERS-4, PERS-404)

Director Naval Education and Training..... CNO (N00T)

Marine Corps Force Structure..... MCCDC (C53)

D. SYSTEM DESCRIPTION

1. Operational Uses. The JPALS is an all-weather, all-mission, all-user landing system based on a local area differential Global Positioning System (GPS) and Inertial Navigation System (INS). The JPALS will allow equipped aircraft to land on any suitable surface worldwide (land or sea), while minimizing impacts to aircraft recovery operations due to low ceiling and/or visibility. The JPALS focus is the precision approach aspect of flying operations.

Current procedures for navigating and sequencing aircraft to the final approach course will remain the same. The JPALS will provide a Joint operational capability for United States forces to perform assigned conventional and special operations missions from fixed-base, tactical, shipboard, and special mission environments under a wide range of meteorological conditions. These operating environments are generally characterized as follows:

a. Fixed-Base Operations. Fixed base operations are characterized as aircraft precision approach and landing operations (military and civil) at prepared fields. The probability of hostile action at fixed-bases can vary from low to high. These airfields can be used for the most demanding levels of air traffic for extended periods of time.

b. Tactical Operations. Tactical operations are characterized as aircraft precision approach and landing operations (military and civil) at an airstrip, bare base, or expeditionary field with limited infrastructure. A high potential for enemy hostile action influences operations. Sustained air traffic may not be as high as fixed-base operations; however, surge launches and recoveries may exceed fixed-base rates. Deployment may be on the order of several days to several months. Examples are combat support, disaster relief efforts, expeditionary airfield operations, etc.

c. Shipboard Operations. Shipboard operations are characterized as aircraft precision approach and landing operations conducted at sea under potentially severe maritime weather and ship motion conditions and in a concentrated electromagnetic environment. Enemy hostile action, if present, will normally be targeted on the aviation ship (not the aircraft themselves), typically from long-range missiles (air, ship, or ground launch) and subsurface threats. These operations are conducted on multiple classes and types of ships that can be deployed individually, within a battle group, or a task force.

d. Special Mission Operations. Special mission operations are characterized as precision approach and landing operations under National Command Authority direction to areas with limited or no infrastructure. These operations may be conducted in politically denied territory or very close to or within enemy lines, with a corresponding high potential for enemy encounter. These operations may be clandestine in nature and would involve fewer aircraft for a shorter period in comparison to fixed-base or tactical operations. The purpose of the mission may be emergency evacuations, humanitarian relief, or special operations. The mission could involve uniquely equipped aircraft and specially trained aircrews. Rapid deployment and air portability are essential to special mission operations.

2. Foreign Military Sales. The Air Force, Army, Navy, Marine Corps, and Coast Guard will employ JPALS. For information concerning Navy and Marine Corps involvement in Foreign Military Sales (FMS), contact the NAVAIR Program Manager, Air (PMA) 213.

3. Acquisition and Development Plan. The JPALS Program will use an Evolutionary Acquisition and Spiral Development process to develop, produce, and field JPALS equipment. The Spiral Development process is aimed at reducing acquisition cycle times. Use of this process will also promote the ability to incorporate the latest technology developments in a timely manner and incremental improvements in operational capabilities. The initial steps in

achieving the benefits of an evolutionary acquisition process for JPALS are as follows: develop a comprehensive set of standards and technical documentation (e.g., interface specifications), develop and mature the selected technologies (reduce technical risks and perform operational assessments), and establish a well defined set of initial user requirements. These initial steps are being carried out using Research, Development, Test, and Evaluation funding during JPALS Architecture and Requirements Definition (ARD), Component Advanced Development (CAD), and Technology Development phases. The program has migrated from ARD and Milestone A through CAD into the Technology Development phase. Milestone B is anticipated in December 2004. Systems Development and Demonstration (SDD) is anticipated to begin one year later at the end of Technology Development. Following a successful Technology Development phase and acquisition Milestone B decision, the JPALS program will be executed through a series of Spiral Development efforts leading to Milestone C. Limited Rate Initial Production is planned for Operational Test and Evaluation (OT&E) efforts and subsequent Full Rate Production will provide incremental operational capability based on individual users, mission requirements, and funds availability.

a. Seven-Tier Acquisition Plan. The Navy JPALS Program will use a seven-tier acquisition logistics plan along with a total life cycle support management strategy. The plan covers the entire scope of actions to be performed by DoD and contractor personnel in the unique management and common support of the development, demonstration, acquisition, fielding, and post-production support of the JPALS Program. Descriptions of the seven tiers are as follows:

(1) Acquisition Tier 1. Tier 1 represents the primary product support development effort for fixed-base, mobile, man-portable, shipboard Category (CAT) II systems and related avionics updates. JPALS procurements planned for Tier 1 include:

- Initial Navy and Marine Corps Local Differential Global Positioning System (LDGPS) Fixed-Base Sites
- All Marine Corps Mobile (expeditionary) and Man-Portable (Special Operations) Systems
- All Ship Relative Global Positioning Systems (SRGPS) for Aircraft Carriers (CV), Aircraft Carriers Nuclear (CVN), Amphibious Assault (LH) type ships, initial Joint Strike Fighter (JSF), and Joint Unmanned Combat Air System (J-UCAS) Avionics Updates

(2) Acquisition Tiers 2, 4, and 6. Tiers 2, 4, and 6 are additional procurements of already developed and fielded avionics upgrades and fixed-base systems with product support emphasis mainly on initial spares and site specific training. JPALS procurements planned for Tier 2 include the remainder of CV and CVN Air Wing aircraft avionics updates and additional Navy LDGPS fixed-base sites. JPALS procurements planned for Tier 4 include the remainder of the Marine Expeditionary Unit composite LH Air Wing Aircraft avionics upgrades and additional Marine Corps LDGPS fixed-base sites. JPALS procurements planned for Tier 6 include the remainder of shore-based aircraft avionics updates and associated

Navy LDGPS fixed-base sites. These tiers share the same Material Support Date (MSD), Navy Support Date (NSD), and Software Support Date (SSD) with Tier 1.

(3) Acquisition Tiers 3 and 5. Tiers 3 and 5 are the continuation of evolutionary product support development and procurement for SRGPS CAT I and stand-alone Tactical Air Navigation (TACAN) emulation SRPGS system variations. JPALS procurements planned for Tier 3 include small combatant SRGPS CAT I ships and associated helicopter avionics updates. JPALS procurements planned for Tier 5 include SRGPS TACAN Emulation ships and Maritime aircraft avionics upgrades.

(4) Acquisition Tier 7. Tier 7 considers the potential use of an existing CV, CVN, and LH shipboard backup system with its own product support upgrade development, modification, and key support dates. JPALS procurements planned for Tier 7 consist of ship backup systems Instrument Carrier Landing System (ICLS+), Automatic Carrier Landing System (ACLS+) or neither, depending on the results of the backup system analysis.

The following table identifies the planned dates for Initial Operational Capability (IOC), MSD, NSD, SSD, and Full Operational Capability (FOC) for each tier:

TIER/EVENT	IOC	MSD	NSD	SSD	FOC
Tier 1	2010	2013	2013	2013	2013
Tier 2	2012	2013	2013	2013	2018
Tier 3	2013	2015	2015	2015	2021
Tier 4	2014	2013	2013	2013	2022
Tier 5	2015	2018	2018	2018	2022
Tier 6	2016	2013	2013	2013	2022
Tier 7	2017	2017	2017	2017	2020

E. DEVELOPMENTAL TEST AND OPERATIONAL TEST. The lead organization for OT&E is the Air Force Operational Test and Evaluation Center (AFOTEC) at Kirkland Air Force Base (AFB), New Mexico. Typically, the Air Force designates a different organization than AFOTEC to be responsible for Developmental Test and Evaluation (DT&E). When this decision is made it will be included in updates to this NTSP.

JPALS testing include a series of Developmental Test (DT), Operational Test (OT), and combined DT and OT events. DT and OT began with system contractor in-plant and system integration testing. Future DTs and OTs will provide the opportunity to include Service unique operational events prior to dedicated Multi-Service OT&E. NAVAIR Patuxent River, Maryland,

is responsible for Navy peculiar DT&E and OT&E. Whenever possible, combined DT and OT will be executed to optimize testing, collect data towards answering Critical Operation Issues, and to input operational concerns into the process early. Status reports will be provided after each combined DT/OT event. Each status report will describe the key issues that will affect both the readiness for OT&E and the eventual evaluation of effectiveness and suitability. A Multi-Service Test and Evaluation status report is required before each milestone decision.

The JPALS Test and Evaluation Master Plan (TEMP) is currently being revised to include a detailed schedule of testing events. When this information becomes available it will be incorporated into updates to this NTSP.

F. EQUIPMENT/SYSTEM/SUBSYSTEM REPLACED

1. Fixed-Base Local Differential Global Positioning System. Current planning is to replace the shore-based Precision Approach Radar (PAR) systems and Instrument Landing system with the Fixed-Base LDGPS.

2. Local Differential Global Positioning System Mobile. The tactical and special missions LDGPS will replace the PAR in Air Surveillance and Precision Approach Radar Control System (ASPARCS).

3. Local Differential Global Positioning System Man Portable. The tactical and special missions LDGPS will replace the PAR in ASPARCS.

4. Ship Relative Global Positioning System. The SRGPS is planned to replace the ACLS unless the ACLS is selected as the backup system. If the SRGPS is selected as the backup system then the SRGPS will replace the ICLS. When the backup system information is determined it will be included in updates to this NTSP.

5. Avionics. The JPALS aircraft avionics upgrades will not replace any existing systems.

6. Shipboard Backup System. To be Determined (TBD)

G. DESCRIPTION OF NEW DEVELOPMENT

1. Functional Description. The envisioned JPALS system, based on differential GPS and INS technology, will consist of modular avionics and ground components to provide a range of landing minima and system configurations that can be tailored to meet mission needs. Ashore, JPALS information will be broadcast from ground systems to aircraft avionics. The shipboard system will incorporate a data link to and from the aircraft avionics and the shipboard system. Aircraft will receive ranging and navigation data from the satellite constellation and differential ranging data or corrections from a ground and shipboard station via a data link. For civil operations, the civil data link and signal-in-space is used. For combat operations, differential corrections are encrypted for transmission and processing with Joint Tactical Radio

System (JTRS) JPALS avionics and stand-alone data links, or JTRS ground systems will also be capable of operating using both the civil and military GPS signals. JPALS will allow equipped aircraft to land on any suitable surface worldwide (land and sea), while minimizing impacts to aircraft recovery operations due to low ceiling and or visibility.

a. Fixed-Base Local Differential Global Positioning System. The Fixed-Base LDGPS is characterized as aircraft precision approach and landing operations (military and civil) at prepared fields down to landing minima of 100 feet Decision Height (DH) and ¼ Statute Mile (SM) visibility, including support for auto-land.

b. Local Differential Global Positioning System Mobile. The LDGPS Mobile is characterized as aircraft precision approach and landing operations (military and civil) at an air strip, bare base, or expeditionary field with limited infrastructure down to landing minima of 100 feet DH and ¼ SM visibility, including support for auto-land. These operations may be allied in nature and include Civil Reserve Air Fleet (CRAF)/civil operations. The JPALS deployment package for tactical operations will include on-site spares for up to a 60-day deployment. Operations beyond this timeframe will require re-supply.

c. Local Differential Global Positioning System Man Portable. LDGPS Man Portable is characterized as precision approach and landing operations under the President and the Secretary of Defense direction that could be conducted at an air strip, bare base, expeditionary field, or in areas with limited or no infrastructure down to landing minima of zero foot DH and 700 feet visibility. The purpose of the mission may be for forced entry/lodgment, special operations emergency evacuations, or humanitarian. Special Operations Forces (SOF) often seize air bases in strike-type operations. Within approximately 30 minutes, a light supporting force is emplaced, security is set up, and initial aircraft flow is established. Rapid deployment and equipment that is extremely small, lightweight (i.e., man-transportable), robust, and reliable enough to withstand typical SOF delivery methods such as by airdrop are essential to special mission operations. The nominal special mission is for a 72-hour operation after which the airfield is evacuated or transitioned to a tactical unit for sustained follow-on operations; therefore, JPALS man-portable equipment may operate off generator power if required. In the SOF environment JPALS will be deployed without spares.

d. Ship Relative Global Positioning System. The SRGPS is characterized as navigation, communications, and monitoring capabilities to support navigation, approach, and landing operations conducted at sea under potentially severe maritime weather and ship motion conditions and in a concentrated electromagnetic environment. Support for fully autonomous vehicles in all phases of flight around the ship is required including auto-land capability for both manned and unmanned vehicles. Enemy hostile action, if present, will normally be targeted on the aviation ship (not the aircraft themselves), typically from long-range missiles (air, ship, or ground launch) and subsurface threats. To mitigate this threat, JPALS must provide the capabilities herein under conditions of Electromagnetic Radiation Control (EMCON). Aviation flight operations are conducted on multiple classes of ships that can be deployed individually, within a battle group, or a task force.

e. Avionics. In many cases, existing GPS, data link, and mission avionics units will be upgraded to accommodate the JPALS solution using an open system architecture approach for GPS functionality. The equipment required to implement an LDGPS precision landing system include a GPS receiver and appropriate antennas, a data link receiver and antenna, and the appropriate integration into the aircraft. The avionics solution will be achieved through use of GPS avionics interfacing with a Data Link (DL) avionics (internal or external to the GPS equipment) or via a multi-mode receiver with embedded GPS and DL functions, depending on aircraft mission requirements for interoperability. For the shipboard environment, the two-way data link capability necessitates the use of the GPS-DL configuration.

f. Shipboard Backup System. As an independent partner with the SRGPS, ICLS+ and ACLS+ are being evaluated to determine which is the most promising affordable Integrated Logistics Support candidate for the shipboard backup operations scenario that addresses the precision approach and landing requirements for CV, CVN, and LH type ships should the primary guidance system totally fail. As a backup, its capabilities will not approach those of the primary system. Approaches are required to be supported to a minimum decision height of 300 feet and visibility of three quarters nautical mile. Existing landing systems must be upgraded to fully meet availability and maintainability requirements.

2. Physical Description. At this point in the JPALS development, specific component configurations are still being developed. When this information becomes available, it will be included in updates to this NTSP.

3. New Development Introduction

a. Fixed-Base Local Differential Global Positioning System. The Fixed-Base LDGPS will be introduced through a new procurement retrofit program for shore based Navy and Marine Corps Air Traffic Control (ATC) facilities.

b. Local Differential Global Positioning System Mobile. The LDGPS Mobile will be introduced to selected Marine Corps activities as new procurement equipment.

c. Local Differential Global Positioning System Man Portable. The LDGPS Man-Portable will be introduced to selected Marine Corps activities as new procurement equipment.

d. Ship Relative Global Positioning System. The SRGPS will be introduced through a new procurement retrofit program for existing Navy ships and as installed equipment on new construction ships.

e. Avionics. The JPALS aircraft avionics upgrades will be installed in existing Navy and Marine Corps aircraft and helicopters through a retrofit program. The JPALS will be delivered as installed equipment on new production aircraft and helicopters.

f. Shipboard Backup System. Shipboard Backup Systems will be introduced through the modification of existing landing systems on CV, CVN, and LH type ships.

4. Significant Interfaces

a. Fixed-Base Local Differential Global Positioning System. At this point in systems development, significant interfaces for the Fixed-Base LDGPS have not been identified.

b. Local Differential Global Positioning System Mobile. At this point in systems development, significant interfaces for the LDGPS Mobile have not been identified.

c. Local Differential Global Positioning System Man Portable. At this point in systems development, significant interfaces for the LDGPS Man Portable have not been identified.

d. Ship Relative Global Positioning System. The SRGPS used aboard CV and CVN type ships will interface with the ATC Battle Force Tactical Trainer/Air Management Node (BFTT/AMN) that includes the AN/TPX-42, AN/SPN-46, Aviation Data Management And Control System (ADMACS), and Integrated Shipboard Information System (ISIS). The SRGPS used aboard LH type ships will interface with the ATC BFTT/AMN that includes the AN/TPX-42, AN/SPN-35, ADMACS, and ISIS.

e. Avionics. Installed JPALS avionics will interface with the aircraft flight control system, and the LDGPS or SRGPS being used.

f. Shipboard Backup System. At this point in systems development, significant interfaces for the Shipboard Backup System have not been identified.

5. New Features, Configurations, or Material. JPALS will provide the next generation precision approach and landing system. No existing system satisfies the mission need for worldwide deployment and interoperability among the services and CRAF; JPALS will satisfy this need.

H. CONCEPTS

1. Operational Concept

a. Fixed-Base Local Differential Global Positioning System. The Fixed-Base LDGPS will not require an operator.

b. Local Differential Global Positioning System Mobile. The LDGPS Mobile requires no operator.

c. Local Differential Global Positioning System Man Portable. The LDGPS Man Portable requires no operator.

d. Ship Relative Global Positioning System. ACs with NEC 6902 and 6903 will operate the SRGPS used aboard CV, CVN, and LH type ships. SRGPSs used aboard other type ships will require no operator.

e. Avionics. JPALS avionics installed in aircraft do not require an operator. It will be used by the Pilot as an automated part of the landing process.

f. Shipboard Backup System. Operator requirements for the Shipboard Backup System will not be identified until the hardware for the system has been identified. When this information becomes available, it will be included in updates to this NTSP.

2. Maintenance Concept. It is anticipated that the JPALS will utilize two levels of maintenance, i.e. organizational and depot, based on the Condition Based Maintenance Plus (CBM+) Concept. CBM+ focuses on inserting technology to support improved maintenance capabilities and business processes into both new and legacy weapon systems. It also involves integrating and changing business processes to dramatically improve logistics system responsiveness. Under consideration are capabilities such as enhanced prognosis/diagnosis techniques, failure trend analysis, electronic portable or point of maintenance aids, serial item management, and automatic identification technology and data-driven interactive maintenance training. The ultimate intent of this initiative is to increase operational availability and readiness throughout the weapon system life cycle at a reduced cost. The desired end state is a force of maintainers who have the knowledge-skill sets and tools to maintain complex systems at the optimal time through the use of available technologies that improve maintenance decisions and integrate the logistics processes. Assessment of current guidance, programs, technologies, and processes is an ongoing action, as is incorporating CBM+ into the requirements and acquisition review and approval process.

Performance data will be collected via the current Maintenance Material Management data reporting and retrieval systems, as well as autonomic capabilities within the operating system. Collected data will be used to track system reliability, maintainability, supportability, availability, and affordability requirements imposed on the design. The results will form the basis for corrections or continuing improvements.

Optimum use of Commercial Off-The-Shelf (COTS) and Non-Developmental Item (NDI) hardware and software is planned. Maximum use of existing maintenance philosophy will be used. Source, Maintenance, and Recoverability (SM&R) coding as suggested by the design contractor and validated through the Repair Level Analysis will form the basis of the maintenance planning processes and Provisioning Technical Data. The SM&R code assignment process will be conducted by the Integrated Product Team (IPT) supply member, contractors, and user representatives based on the guidelines in NAVAIR Instruction 4423.11A. Provisioning includes item selection, Design Change Notice actions, and SM&R coding of Support Equipment (SE) Recommendation Data (SERD) sheets. The coding assignment should begin during SDD.

a. Organizational. Organizational maintenance will consist of Preventive Maintenance (PM) and Corrective Maintenance (CM) actions performed in accordance with JPALS maintenance instructions. Although the technicians required to maintain the Fixed-Base LDGPS, LDGPS Mobile, LDGPS Man Portable, SRGPS, and JPALS Shipboard Backup system have not been identified at this point in JPALS development, the most likely candidates to be considered are the Electronics Technicians (ET) that maintain current PAR equipment, the ETs

that maintain the Carrier Air Traffic Control Center (CATCC) and Amphibious Air Traffic Control Center (AATCC) Direct Altitude Identity Readout (DAIR) Systems, or the Information System Technicians (IT) that maintain the ADMACS and ISIS. The contractor will perform a Task and Skills Analysis during the SDD phase that will lead to the identification of qualitative and quantitative maintenance manpower requirements needed to support the JPALS. The same maintenance technicians that currently maintain the aircraft's other avionics systems will maintain JPALS avionics. These maintenance personnel are identified by NEC and MOS in the applicable aircraft NTSP.

(1) Preventive Maintenance. PM for the Fixed-Base LDGPS, LDGPS Mobile, LDGPS Man Portable, and SRGPS JPALS will use Prognostics Health Management and Remote Health Monitoring Systems. PM actions such as cleaning and corrosion control will be accomplished in accordance with applicable Maintenance Requirements Cards. PM of the LDGPS Mobile and LDGPS Man Portable JPALS will be performed between deployment cycles. JPALS aircraft avionics will be maintained in accordance with applicable aircraft MRCs. At this point in the JPALS development, a preventive maintenance plan for the Shipboard Backup System has not been developed.

(2) Corrective Maintenance. CM of the Fixed-Base LDGPS, LDGPS Mobile, LDGPS Man Portable, and SRGPS JPALS will consist of Line Replaceable Unit removal and replacement and limited on-site repair using Built-In Test (BIT) background diagnostics. The SRGPS will require on-equipment maintenance while the system is in operation without personnel and system harm or performance degradation below minimum performance requirements. Corrective maintenance of JPALS aircraft avionics will consist of removal and replacement of faulty assemblies using BIT. A corrective maintenance plan for the Shipboard Backup System has not been developed.

b. Intermediate. Not Applicable (NA)

c. Depot. Depot level maintenance is tied to the COTS/NDI applications and maximum use of existing sustainable sources of supply. Unique elements will undergo a Source of Repair Level Analysis and Core/Business Case Analysis during SDD to determine the optimum classification (consumable or repairable) and subsequent depot repair site assignment, (i.e., commercial or organic). Depot support will be based on the agile logistics philosophy of just in time replenishment of spares.

d. Interim Maintenance. TBD

e. Life Cycle Maintenance Plan. TBD

3. Manning Concept

a. Estimated Maintenance Man-Hours per Operating Hour. The Operational Requirements Document (ORD) states that JPALS require no more than two hours scheduled maintenance in 30 days (threshold) and require no more than one hour in 90 days (objective).

The following Mean Time Between Failure (MTBF) and Mean Repair Time (MRT) thresholds and objectives have been established to reduce logistics footprint and life cycle cost over legacy systems. MTBF is based on any downing event or failure that degrades system performance below acceptable parameters while in an operational environment. MRT is based on the average labor hours expended per corrective maintenance action.

RELIABILITY/MAINTAINABILITY				
SYSTEM	MTBF		MRT	
	THRESHOLD	OBJECTIVE	THRESHOLD	OBJECTIVE
Fixed-Base	≥ 4,000 hours	≥ 5,000 hours	≤ 30 minutes	≤ 20 minutes
Shipboard	≥ 4,000 hours	≥ 5,000 hours	≤ 120 minutes	≤ 60 minutes
Special Mission	≥ 4,320 hours	≥ 4,400 hours	≤ 30 minutes	≤ 20 minutes
Tactical	≥ 4,320 hours	≥ 4,400 hours	≤ 30 minutes	≤ 20 minutes
Shipboard Backup System	≥ 800 hours	≥ 1,000 hours	≤ 1.6 hours	≤ 1.6 hours

Operational Availability measures the inherent probability that the JPALS system is ready to perform its specified function, in its specified operational environment, when called for at a random point in time. JPALS service Operational Availability does not include avionics failures or the effects of scheduled JPALS ground system maintenance or training which can be scheduled to avoid an impact on operations at a particular site. Avionics failures that affect individual aircraft and not the overall JPALS service are subject to the host platform availability requirements. Service operational availability includes the contribution of GPS signal-in-space availability, which is a function of constellation characteristics and availability of reliable and adequate satellite data.

OPERATIONAL AVAILABILITY		
SYSTEM	THRESHOLD	OBJECTIVE
Fixed-Base	≥ 99.5 %	≥ 99.6 %
Shipboard	≥ 99.7 %	≥ 99.9 %
Special Mission	≥ 98.0%	≥ 98.0%

OPERATIONAL AVAILABILITY		
SYSTEM	**THRESHOLD**	**OBJECTIVE**
Tactical	≥ 99.0%	≥ 99.5 %
Shipboard Backup System	≥ 95.0%	≥ 96.0 %
Aircraft Avionics	Consistent with Host Platform	

b. Proposed Utilization

(1) Fixed-Base. The Fixed-Base LDGPS will be able to sustain operations 24 hours per day, seven days per week.

(2) Shipboard. The SRGPS will be able to sustain a six month CV or CVN deployment at a 15 hour per day utilization rate, using Performance-Based Logistics sparing, and on-site support personnel for PM and CM (threshold), and sustain the same deployment assuming 20 hour per day (objective). SRGPS will sustain a six month LH and small ship deployment at a 12 hour per day utilization rate, using Performance-Based Logistics sparing, and on-site support personnel for PM and CM (threshold) and sustain the same deployment assuming 15 hour per day utilization rate (objective).

(3) Special Mission. Special Mission JPALS man portable will sustain a 72-hour deployment with four hours full operation and 68 hours in standby (threshold), and sustain a 72-hour deployment with eight hours full operation and 64 hours in standby (objective). Special Mission JPALS will use only power sources provided in the deployment package and will operate without a critical failure or need for any scheduled maintenance while deployed. If required, Special Mission JPALS will be able to operate off generator power.

(4) Tactical. The Tactical JPALS mobile will be able to sustain a 60-day deployment at a 24-hour per day utilization rate, using deployment package logistics assets and on-site support personnel for mission limiting failures or required PM.

(5) Shipboard Backup System. The Shipboard Backup System will sustain a six-month deployment at 20 hours per day (CV or CVN) and 12 hours per day (LH) utilization rates, using Performance-Based Logistics sparing, and onsite support personnel for PM and CM maintenance.

(6) Aircraft Avionics. Aircraft avionics will be able to sustain operations consistent with the host platform.

c. Recommended Qualitative and Quantitative Manpower Requirements. Various manpower analyses are being conducted during JPALS development under the guidance

of MIL-HDBK-759 series to define Navy JPALS manpower requirements. The results of these analyses will form the basis for billet, manning, and skills requirements.

(1) Operator Manpower. The SRGPS will be operated by AC personnel aboard CV, CVN, and LH type ships. The SRGPS will provide data to drive the two displays for the final controllers without requiring a change in procedures. A goal is to reduce these two positions to one. Tactical deployments are manpower constrained. The special mission environment requires zero personnel because special tactics teams deploy without support personnel. Current ground system authorized manpower levels will not be exceeded.

(2) Maintenance Manpower

(a) Tactical and Shipboard JPALS. The total number of dedicated maintenance personnel needed to support JPALS per shift will be no more than one person.

(b) Special Mission JPALS. The special mission environment requires zero personnel because Special Tactics Teams deploy without support personnel.

(c) Non-Deployed Systems. Non-deployed LDGPS ground systems include fixed-base and tactical and special mission systems when in garrison. The total number of dedicated maintenance personnel needed to support JPALS per shift will not exceed current authorized levels.

(d) Avionics. JPALS aircraft avionics will be maintained by the same Navy and Marine Corps squadron avionics technicians that maintain current aircraft avionics systems. This manpower is identified in individual aircraft NTSPs.

4. Training Concept. The training concept for the Navy is twofold, i.e., Navy unique and DoD common. PMA205 is the Training Manager for Navy unique JPALS systems. The Air Force Program Office at the Electronic Systems Center (ESC), Hanscom Air Force Base, Bedford, Massachusetts, is the Training Manager for DoD common JPALS systems. PMA205 is also the training lead for interface with ESC Hanscom on common training efforts. PMA205 interfaces closely with Human Factors Engineers, support and development contractors, Navy and Marine Corps users, and Navy training personnel. The Navy unique training concept is officially defined in this NTSP. The DoD common training concept will be officially defined and maintained within the Air Force developed Joint Training Plan.

The intent of the JPALS training program is to provide proficient JPALS operator and maintenance personnel required at the organizational level. The JPALS training program will consist of initial and follow-on training for operators and maintenance personnel. Initial training will be provided by the contractor for test team members, installation team members, and initial cadre personnel. It is anticipated that initial on-site training will be conducted at Fixed-Base LDGPS sites and aboard SRGPS CV, CVN, and LH type ships during installation. Follow-on JPALS operator training for SRGPS CV, CVN, and LH type ships will be accomplished by modifying existing courses to include SRGPS information. Fixed-Base LDGPS will not require

an operator. Follow-on maintenance training requirements for Fixed-Base LDGPS, LDGPS Mobile, LDGPS Man Portable, and SRGPS JPALS will not be determined until after the qualitative maintenance technician requirements have been identified. The same Navy and Marine Corps squadron avionics technicians that maintain current aircraft avionics systems will maintain JPALS aircraft avionics. JPALS avionics training will be incorporated into applicable maintenance courses identified in individual aircraft NTSPs.

The established training concept for most aviation maintenance training divides "A" School courses into two or more segments called *Core* and *Strand*. Many organizational level "C" School courses are also divided into separate *Initial* and *Career* training courses. "A" School *Core* courses include general knowledge and skills training for the particular rating, while "A" School *Strand* courses focus on the more specialized training requirements for that rating and a specific aircraft or equipment, based on the student's fleet activity destination. *Strand* training immediately follows *Core* training and is part of the "A" School. Upon completion of *Core* and *Strand* "A" Schools, Navy graduates going to organizational level activities attend the appropriate *Initial* "C" School for additional specific training. *Initial* "C" School training is intended for students in paygrades E-4 and below. *Career* "C" School training is provided to organizational level personnel, E-5 and above, to enhance skills and knowledge within their field. "A" School graduates going to intermediate level activities attend the appropriate intermediate level "C" School.

JPALS avionics training will conform to the Chief of Naval Operations (CNO) directive for *Initial* and *Career* training. The *Initial* training pipeline is intended to provide junior enlisted (E-1 through E-4) and first tour in Type/Model/Series (T/M/S) maintenance technicians the basic skills required to maintain the JPALS avionics. The *Career* pipeline is intended to provide advanced T/M/S skills training to career designated (E-5 and above) maintenance personnel.

Any newly developed follow-on maintenance will be developed to comply with the integrated training method in accordance with CNO directives. Integrated training consists of classroom, laboratory, and timely practical application of newly learned skills combined into a single training period.

a. Human Performance. The contractor will identify the physical and cognitive capabilities of the existing Navy personnel structure (e.g., rating, NECs, and MOSs) and determine skills and knowledge capabilities. A requirements analysis will be conducted to identify the media requirements of the JPALS training system to meet operational and maintenance training needs. The operational maintenance training needs are those human task performance requirements that enable operators to accomplish missions and technicians to maintain the equipment in mission ready condition. Human performance requirements are stated in the individual, team, and collective tasks required to operate and maintain the JPALS. Optimizing performance of these tasks will be a critical contribution to readiness. Critical human performance tasks that are appropriate to train using a simulator constitute the overall training simulator requirement.

(1) Training Situation Analysis. The contractor will conduct a Training Situation Analysis to determine JPALS training needs. The Training Situation Analysis will

consider the impact to both the operator and maintainer training programs and will include recommendations to modify or procure necessary training equipment and materials.

(2) Mission and Task Analysis. The contractor will analyze the JPALS mission and related individual and collective tasks. Each task will be analyzed for difficulty level, frequency, importance, and skill decay factors and a listing of JPALS tasks requiring training will be generated. This source data will be used to develop an Instructional Performance Requirements Document that will contain the data to support the design of the JPALS training program.

(3) Media Analysis. The contractor will use the task analysis results to identify the type of learning required, develop instructional strategies and methods, and identify the most effective media that supports the sensory stimulus required of each task. The contractor will develop and provide to the Government an Instructional Media Requirements Document to serve as the baseline for the instructional media performance specifications. This document will contain a description of the primary and alternate media requirements and the functional requirements for the instructional delivery. The contractor will analyze the existing ATC training systems for inclusion, exclusion, or modification and investigate the use of Computer-Based Training (CBT) to supplement classroom instruction. Based on the results of this analysis, the contractor will provide recommendations for the design and implementation of the JPALS training program that will include safety, hazard, and environmental considerations. Upon Government approval of the design, the contractor will develop an Instructional Media Package that contains the visual, textual, and audio design documentation for use in the development and presentation of operator and maintenance training. During media analysis every effort will be made to enhance training by using CBT. This approach will eliminate curricula duplication and retraining students when they transition from a classroom environment to the Practical Application (PA) phase of the course. All newly developed CBT for JPALS training courses will be Sharable Content Object Reference Model (SCORM) conformant.

b. Training Media Life Cycle Management. Maintenance training courses will be managed by the Course Model Manager (CMM). The CMM is responsible for course configuration control and logistics support requirements. The CMM for operator courses will be the Naval Air Technical Training Center (NATTC), Pensacola, Florida. The CMM for maintenance training has not been identified at this time.

The Assistant Program Manager, Training Systems (APMTS), PMA205-3E1, is responsible for reviewing all JPALS Engineering Change Proposals and assessing their impacts on the training system. The CMM is responsible for maintaining the courseware concurrency for operator and maintenance practices. The Training Element Manager also ensures that changes to basic equipment include provisions to modify training equipment and update training courses and curricula as necessary to maintain effective up-to-date training capabilities. Following the end of the manufacturer's interim training system support period, the day-to-day maintenance and support of operator trainers is funded by the Type Commander and managed under a Contractor Operation and Maintenance of Simulators or Contractor Logistics Support contract.

The Naval Education and Training Command (NETC) (via Chief of Naval Education and Training Instruction 1500.30) established policy, procedures, and responsibility for the administration and operation of the NETC training feedback program. This program provides a web-based homepage template containing a training feedback form icon. Each school is to develop a form following this format with a link back to the NETC homepage at https://www.cnet.navy.mil. This web page form is used to receive feedback on any training issue, training concerns, or to make general recommendations. A Fleet partnership program will also be established to develop a close relationship with representative samples of customers to evaluate the quality of the trained graduates and the relevance of skills trained.

c. Training Media and Delivery Method. The training media and delivery method to be used for JPALS training is to be determined. Formative evaluations of the JPALS training system will be conducted throughout in-process reviews, design evaluations, course trials, and examinations by the JPALS Training IPT. The final formative evaluation will be conducted in accordance with the training system Test and Acceptance Plan. Upon Government approval, the contractor will develop an Instructional Media Package that contains the visual, textual, and audio design documentation for use in the development and presentation of operator and maintainer training.

d. Initial Training. Initial JPALS training will be provided by the contractor for Test and Evaluation team members, installation team members, and initial cadre personnel. When these courses are developed, the information will be included in updates to this NTSP.

e. Follow-on Training

(1) Operator. Follow-on JPALS operator training for SRGPS CV, CVN, and LH type ships will be accomplished by modifying to include SRGPS information the existing courses *C-222-2012, Carrier Air Traffic Control Center Operator*, and *C-222-2019, Amphibious Air Traffic Control Center Operations,* both currently available at NATTC Pensacola. No increase in course length is anticipated. An operator will not be required for the Fixed-Base LDGPS configuration of JPALS.

Title.....	**Carrier Air Traffic Control Center Operator**
CIN	C-222-2012
Model Manager	NATTC Pensacola
Description	This course provides training to the Air Traffic Controller, including: ° Organization, Directives, Rules, Procedures, and Phraseology Related to CATCC ° Shipboard Organization and Interrelations ° Operational Directives ° Carrier Naval Air Training and Operating Procedures Standardization (NATOPS) ° CATCC Doctrine, Operation Orders, and Daily Air Plans ° CATCC Radar ° DAIR System ° Informational Display System ° Duties, Responsibilities, and Skill Requirements Associated with Different Operational and Controller Positions in the CATCC ° CATCC Controller and Status Board Keeper Watch Station Operations Under Simulated Operational Conditions Upon completion, the graduate will be qualified to perform functions under direct supervision in a CATCC that lead to completion of Federal Aviation Administration (FAA) requirements for a CATCC Watch Stander.
Delivery Method	Total Course of Instruction .....240 hours Instructor-Led .....60 hours Instructor-Led with CAI .....0 hours ICW (not Instructor-Led).....0 periods PA/Laboratory .....180 hours
Length.....	42 days
Location.....	NATTC Pensacola
RFT Date	Currently available. The RFT date with the JPALS is 2009.
Skill Identifier	AC 6902
TTE/TD	Advanced Carrier ATC Training System Device 15G30
Prerequisite.....	C-222-2010, Air Traffic Controller Class A1

Title	**Amphibious Air Traffic Control Center Operations**
CIN	C-222-2019
Model Manager	NATTC Pensacola
Description	This course provides training to the AC, including: ° Organization, Directives, Rules, Procedures, and Phraseology Related to AATCC ° Amphibious Air Operations ° Amphibious Task Force Organization and Command Relationships ° Tactical Air Control Squadron Operations and How They Relate to Operations in an AATCC ° Operations Control Division Responsibility for Equipment and Pre-Launch Brief ° Publications, Charts, and Messages Used During Amphibious Air Operations ° AATCC Watch Station Duties and Responsibilities ° Air Traffic Control Doctrine; Departure, Assault, and Recovery Procedures for Both Helicopter and Vertical/Short Take Off and Landing During Case I, II, and III Operations ° AATCC Radar ° DAIR System ° Status Boards ° AATCC Watch Station and System Operations Functions Under Simulated Operational Conditions Upon completion, the graduate will be qualified to perform functions under direct supervision in an AATCC that lead to completion of FAA requirements for an AATCC Watch Stander.
Delivery Method	Total Course of Instruction .....240 hours Instructor-Led .....40 hours Instructor-Led with CAI .....0 hours ICW (not Instructor-Led).....0 periods PA/Laboratory .....200 hours
Length	40 days
Location	NATTC Pensacola
RFT Date	Currently available. The RFT date with the JPALS is 2009.
Skill Identifier	AC 6903
TTE/TD	Amphibious ATC Training System Device, 15G30
Prerequisite	C-222-2010, Air Traffic Controller Class A1

(2) Maintenance

(a) Organizational. Follow-on maintenance training requirements for Fixed-Base LDGPS, LDGPS Mobile, LDGPS Man Portable, and SRGPS JPALS will not be determined until after the qualitative maintenance technician requirements have been identified during SDD. The most likely candidates to be considered are the ETs that maintain current PAR equipment, the ETs that maintain the CATCC and AATCC DAIR Systems, or the ITs that maintain the ADMACS and ISIS. Training for these operators would most likely be accomplished by either modifying existing courses, developing new courses to be incorporated into existing tracks, or developing new, stand-alone JPALS courses. The same Navy and Marine Corps squadron avionics technicians that maintain current aircraft avionics systems will maintain JPALS aircraft avionics. JPALS avionics training will be incorporated into applicable maintenance courses for all Navy and Marine Corps aircraft.

(b) Intermediate. NA

f. Student Profiles

SKILL IDENTIFIER	PREREQUISITE SKILL AND KNOWLEDGE REQUIREMENTS
AC 6902, 6903	C-222-2010, Air Traffic Controller

g. Training Pipelines. Pilot courses for all Navy and Marine Corps aircraft will require modification to include JPALS.

I. ONBOARD (IN-SERVICE) TRAINING

1. Proficiency or Other Training Organic to the New Development

a. Maintenance Training Improvement Program. NA

b. Aviation Maintenance Training Continuum System. AMTCS will provide career path training to the Sailor or Marine from their initial service entry to the end of their military career. AMTCS concepts will provide an integrated system that will satisfy the training and administrative requirements of both the individual and the organization. The benefits will be manifested in the increased effectiveness of the technicians and the increased efficiencies of the management of the training business process. Where appropriate, capitalizing on technological advances and integrating systems and processes can provide the right amount of training at the right time, thus meeting the CNO's mandated "just-in-time" training approach.

Technology investments enable the development of several state-of-the-art training and administrative tools: Interactive Multimedia Instruction for the technicians in the

Fleet in the form of Interactive Courseware (ICW) with Computer Managed Instruction and Computer Aided Instruction (CAI) for the schoolhouse.

Included in the AMTCS development effort is the Aviation Maintenance Training Continuum System - Software Module, which provides testing (Test and Evaluation), recording (Electronic Certification Qualification Records), and a Feedback system. The core functionality of these AMTCS tools are based and designed around the actual maintenance-related tasks the technicians perform, and the tasks are stored and maintained in a Master Task List data bank. These tools are procured and fielded with appropriate COTS hardware and software, i.e., Fleet Training Devices - Laptops, Personal Computers, Electronic Classrooms, Learning Resource Centers, operating software, and network software and hardware.

2. Personnel Qualification Standards. TBD

3. Other Onboard or In-Service Training Packages

a. Federal Aviation Administration Certification. Upon completion of AC "A" school, each graduate is awarded an FAA certificate that qualifies that individual to work in an ATC environment as a trainee. Each ATC activity has a Control Tower Operator (CTO) training package specifically tailored to the FAA rules and requirements of that specific location. Once the local training package has been successfully completed, an FAA CTO certificate is awarded. This certificate permits the recipient to perform as an ATC at that specific activity. The FAA CTO certificate is good only for the activity at which it was earned. Upon transfer to a new ATC activity, the individual must be recertified at that activity by successfully completing the CTO training package specifically developed for that activity.

b. Maintenance Training Management and Evaluation Program. The Marine Corps Maintenance Training Management and Evaluation Program is planned to be replaced by AMTCS before the projected JPALS IOC date of 2010.

J. LOGISTICS SUPPORT

1. Manufacturer and Contract Numbers

CONTRACT NUMBER	MANUFACTURER	ADDRESS
Concept and Technology Development Contract DAAB07-03-D-B006	ARINC	2551 Riva Road Annapolis, MD 21401
The SDD Contract will be awarded upon achievement of Milestone B scheduled for Fiscal Year (FY) 05.	TBD	TBD

CONTRACT NUMBER	MANUFACTURER	ADDRESS
The Production and Deployment contract will be awarded upon achievement of Milestone C scheduled for FY09.	TBD	TBD

2. Program Documentation

DOCUMENT TITLE	RESPONSIBLE AGENCY	DATE/VERSION
Joint Air Force and Navy Mission Need Statement (JMNS) for Precision Approach and Landing Capability	Air Force HQ AFFSA/XR	8 Aug 94 JMNS 002-94
User Logistics Support Summary (ULSS) for the AN/SPN-46(V)	PMA213	Jun 97 Approved
JPALS Analysis of Alternatives	Joint IPT	28 Oct 97 Approved
JPALS Single Acquisition Management Plan	Air Force HQ AFFSA/XR	15 Sep 98 Version V12
Architecture and Requirements Definition TEMP for JPALS	Air Force HQ AFFSA/XR	11 Jun 99 Approved
ORD for the JPALS	Air Force HQ AFFSA/XR	19 Mar 03 Draft
Navy Acquisition Logistics Support Plan (ALSP) for JPALS	NAVAIR PMA213	30 Jul 03 Initial Draft
Development TEMP for JPALS	Joint IPT	Nov 03 Draft Version r1.2

3. Technical Data Plan. The JPALS ORD requires that all new technical manuals, electronic technical manuals, and IETMs be acquired in Class V Extendable Markup Language. As such, the Navy JPALS SRGPS product support program is aggressively seeking Class V IETM capability embedded in the equipment's operating system and integrated with equipment BIT diagnostics and prognostics interfaces. Troubleshooting, spares ordering, and maintenance planning with increased equipment availability is required to be obtained by the JPALS technical data program. The Class V IETM is at the heart of the product support strategy. The Navy is coordinating with the Air Force to share efforts in hopes that the common segments (i.e., fixed-

base, mobile, and man portable LDGPS systems) the Navy will be procuring uses the same Class V technology. One aspect of market research in the technical development phase is to validate the level or class achievable within technology, cost, and schedule. Also, a decision will be made as whether Class V IETM technology can be integrated within the Tier 1 development or must be adopted as evolutionary. The IETM will not only be linked to BIT prognostics/ diagnostics but to embedded virtual training and spares projection aspects of the system. IETM analysis, development, and integration into the JPALS software is planned under Tier 1. Detailed IETM milestones are under development and will be provided prior to SDD.

a. Interactive Electronic Technical Manual Integration. Class V IETMs allow the subject matter experts in all areas (e.g., troubleshooting, fault isolation, accomplishing repairs, establishing alternate repair paths) to bring their knowledge to the maintenance unit and apply it in a specific situation. The system and equipment diagnostic programs can "talk" directly to the user through the IETM; relatively unskilled technicians can be led through complex procedures. Seldom-used processes and procedures (e.g., annual inspections) can be properly planned and executed without significant research. Programs will also typically analyze the data received and add it to the knowledge base to allow the software to "learn" and apply the knowledge to future analytical processes.

b. Interactive Electronic Technical Manual Validation and Verification. IETM validation will coincide with mission hardware and software developmental testing during SDD. IETM verification will occur during the Logistics Demo I leading to system operational availability in SDD.

c. Interactive Electronic Technical Manual Sustainment and Evolutionary Improvements. Once the IETM development, demonstration, and verification efforts have been successfully accomplished and the resultant embedded capability exists within the hardware operating system, major emphasis will be directed on sustaining accurate content and process. It is anticipated that approximately every five years each type system will completely cycle through evolutionary improvement. This improvement will require IETM update commensurate with individual hardware configuration. The challenge will be to exercise cooperative integrated parallel effort between hardware, software, and support system engineering. Tier sustained support budgets have been programmed for such effort. Thus, tracking performance-to-cost is important if funds will be available to sustain optimum performance.

4. Test Sets, Tools, and Test Equipment. Based on the ORD, JPALS systems will have minimal reliance on external special purpose electronic test equipment and general-purpose electronic test equipment. JPALS will use existing ground handling equipment. Organic depot support equipment will be that type of automatic test equipment approved by the Service selected to be the source of repair or commercial equivalent from the manufacturer.

The SERD process will be used for JPALS. Once all options have been exhausted, a SERD will be generated representing the proposed, existing, or new item of SE. PMA213 will coordinate the SERD approval process and ensure the SE is developed or registered for use by JPALS.

5. Repair Parts. The JPALS supply support concept is based on a Performance-Based Logistics common supply support strategy for service common components, as well as NDI and COTS. Peculiar components will be minimized and integrated into the common approach to the maximum extent, especially when determining system design and producibility. The supply support strategy capitalizes on designing an enhanced technical capability and dependability that shares a possible built-in spares design approach to improve system reliability, sustainment, and dependability during operations, and lessen supply support impact to readiness. Initial supply through spares and repair parts provisioning will be based on an allowance plan designed around operational tempo and system performance. Re-supply will be based on an agile logistics Just-In-Time Direct Delivery approach for fixed-base systems and deployed units. Integrated Supply Chain Management techniques and processes will be employed to fully implement Future Logistics Enterprise end-to-end distribution concepts. In keeping with the DoD focused logistics vision, the deployable supply support contingency package concept will be evaluated for possible use with Marine Corps expeditionary and man-portable systems.

6. Human Systems Integration. The JPALS program is pursuing HSI initiatives to optimize total system performance and minimize total ownership cost; these initiatives will be integrated into the acquisition process. HSI analysis began with the identification of a need and deficiency in legacy ATC equipment. Human performance requirements have been identified and reflected in the appropriate requirements, test, and solicitation documents of the acquisition process. The JPALS design will address all seven Human Systems Integration (HSI) elements. To reduce the cost of ownership, various analyses will be performed, including manpower, personnel, and training. These analyses will recommend options that maximize the use of technology to reduce manpower, personnel, and training requirements. Tradeoffs that reduce these requirements will be favored during design and development.

a. Human Engineering. Steps are being taken (e.g., contract deliverables and government and contractor IPTs) to ensure the proper employment of Human Engineering and cognitive engineering during the Systems Engineering process to provide for effective human-machine interfaces, meet HSI requirements, and (as appropriate) support a family-of-systems acquisition approach. A Human Engineering program is being established to develop effective human-machine interfaces. Human Engineering is the application of Human Performance principles, models, measurements, and techniques to system design. Human Engineering takes human physical and cognitive capabilities and limitations into consideration during all phases of system design to preclude system characteristics that require extensive cognitive, physical, or sensory skills; require complex manpower or training intensive tasks; or result in frequent or critical errors. The following Human Engineering requirements are critical to JPALS:

(1) User Interfaces. JPALS will be as easy to use as existing approach and landing systems. The user interface will provide efficient workload management through the effective use of graphical displays, text displays, and presentation of system and task status information.

(2) System Operation. Design of controls, displays, symbology, and operating procedures will promote smooth, expeditious, and error free system operation.

(3) Handling Qualities. JPALS evaluation for manned aircraft using the Pilot Handling Qualities Ratings will be equivalent to, or better than, current systems.

(4) Messages and Displays. System messages and displays presented to operators will be appropriate and relevant to operator's activities and knowledge levels.

(5) Night Visibility. Except for use of pre-existing displays, any aircraft or tactical/special mission visual display, readout, or operator message will be visible at night with or without night vision devices and selectable by the user.

(6) Error Checking. User interface commands will be designed to minimize operator performance errors and preclude operator errors on critical tasks through the use of error checking user validation or other methods.

b. Manpower. The JPALS support strategy will document the approach being used to provide the most efficient and cost effective mix of DoD manpower and contract support and identify any cost or schedule issues (e.g., uncompleted studies) that could impact the ability to execute the program. In all cases, the JPALS Logistics Manager consults with the manpower community in advance of contracting for operational support services to ensure that sufficient workload is retained in-house to adequately provide for military career progression, sea-to-shore or overseas rotation, and combat augmentation. The JPALS Logistics Manager ensures that inherently governmental and exempted commercial functions are not contracted. Detailed manpower milestones are under development and will be provided prior to the System Requirements Review.

c. Personnel. Major personnel initiatives have been identified for the JPALS program that are necessary to achieve readiness or rotation objectives or reduce manpower or training costs. The support strategy addresses modifications to the knowledge, skills, and abilities of NECs and MOSs for system operators, maintainers, or support personnel if the modifications have cost or schedule issues that could adversely impact program execution. The support strategy will also address actions to combine, modify, or establish new NECs and MOSs or additional skill indicators, or issues relating to hard-to-fill occupations if they impact the Program Manager's ability to execute the program.

d. Training and Performance Support. Major elements of the training system described in DoD Directive 1430.13 are summarized in the support strategy, and training initiatives are identified that enhance the user's capabilities, improve readiness, or reduce individual and collective training costs. Planned training will maximize the use of new learning techniques, simulation technology, embedded training, and instrumentation systems to provide anytime, anyplace training that reduces the demand on the training establishment and reduces total operating cost. The JPALS program will coordinate work with the training community to develop options for individual, collective, and joint training for the personnel who will operate, maintain, support, and provide training for the system.

e. Environment, Safety, and Health. Environment, Safety, and Occupational Health (ESOH) requirements relating to the JPALS will be identified during system test and evaluation.

f. Habitability. The JPALS program will address habitability requirements (e.g., for the physical environment and support services) that are necessary for meeting and sustaining system performance, avoiding personnel retention problems, maintaining quality of life, and minimizing total system costs.

g. System Safety. System Safety processes identify and prevent hazards associated with system design, integration, and use; The JPALS program will address system safety with the operational community to manage system safety risks, if they cannot be eliminated.

h. Survivability. Personnel survivability is set of design characteristics or operational characteristics of a system that reduce fratricide, prevent damaged if attacked, minimize the likelihood and extent of injuries if attacked, reduce mental and physical fatigue, and reduce detectability by the enemy. For any missions that expose personnel to combat threats, the JPALS program will address survivability issues. The JPALS program will also address special equipment or gear needed to sustain operations in the operational environment.

K. SCHEDULES

1. Installation and Delivery Schedules. JPALS installations will follow the schedule established in the JPALS product support program. Installations are divided into seven tiers. Production deliveries are scheduled to begin in FY09.

a. Tier 1. Tier 1 represents the primary product support development effort for fixed-base, mobile, man-portable, shipboard CAT II systems, and related avionics updates.

TIER 1 INSTALLATION SCHEDULE

FISCAL YEAR/LOCATION	09	10	11	12	13	14	15	16	17	18	19	20
Fixed-Base LDGPS												
MCAS Beaufort			1									
MCAS Cherry Point					1							
MCAS Futenma, Okinawa				1								
MCAS Iwakuni, Japan				1								
MCAS Miramar			1									
MCAS New River			1									
MCAS Yuma					1							

FISCAL YEAR/LOCATION	09	10	11	12	13	14	15	16	17	18	19	20
NAS Lemoore					1							
NAS Oceana				1								
NAS Patuxent River												
Mobile Systems Deliveries (No installation required)												
Special Mission Units		2	3	3	3							
Man-Portable Systems Deliveries (No installation required)												
Special Tactics Teams		2	2	2	1							
Avionics Upgrades												
F-35B Amphibious-Based	4	8	14	3	4	3	4	3	4	3	4	3
F-35C Carrier-Based	4	7	14	4	3	4	3	4	3	4	3	4
SRGPS Cat II Ship Systems												
CV/CVN	1	1	3	2	2							
LHA			1	2	2							
LHD	1	1	1	2	1							
SRGPS Cat II Shore Systems												
NATTC Pensacola		1										

b. Tier 2. Tier 2 consists of follow-on procurement and installation of carrier wing aircraft and additional fixed-base sites.

TIER 2 INSTALLATION SCHEDULE

FISCAL YEAR/LOCATION	09	10	11	12	13	14	15	16	17	18	19	20
Fixed-Base LDGPS												
NAF Atsugi, Japan						1						
NALF Orange Grove									1			
NALF San Clemente									1			
NALF San Nicolas								1				
NAS Fallon							1					
JRB Fort Worth							1					
JRB New Orleans								1				

FISCAL YEAR/LOCATION	09	10	11	12	13	14	15	16	17	18	19	20
NAS Oceana, Air Detachment Norfolk									1			
NAS North Island									1			
NAS Whidbey Island								1				
NS Ventura County						1						
NS Mayport					1							
NS Roosevelt Roads, Puerto Rico							1					
Naval Support Facility Diego Garcia						1						
NALF Imperial Beach					1							
Avionics Upgrades												
F/A-18A/C/D			83	84	84	83	95					
F/A-18E/F				34	68	68	68	105	100	100		
C-2A				9	9	9	9					
E-2C					17	17	17	18				
EA-6B/EA-18G				16	16	16	16	22	17	10		
MH-60R				47	47	47	46	46				
MH-60S				47	48	48	47	47				

c. Tier 3. Tier 3 consists of SRGPS CAT I ships and associated helicopter systems.

TIER 3 INSTALLATION SCHEDULE

FISCAL YEAR/LOCATION	11	12	13	14	15	16	17	18	19	20	21	22
SRGPS Cat I Systems												
AOE-1			2	2								
TAFS			4	4	4							
CG 47			5	6	6	6	4					
DD 21			3	4	5	4	3	3	3			
DDG 79			7	8	7	7						

FISCAL YEAR/LOCATION	11	12	13	14	15	16	17	18	19	20	21	22
LPD			2	4	4	3	3					
AGF 11			1									
Avionics Upgrades												
AB-139				3	7	4	3		4	4	4	5
HH-60J		7	8	8	7							
HH-65A/B			45	24	24							
HV-911			21	16	16	5	5	6				

d. Tier 4. Tier 4 consists of additional fixed-base sites and Marine Corps air wing aircraft.

TIER 4 INSTALLATION SCHEDULE

FISCAL YEAR/LOCATION	11	12	13	14	15	16	17	18	19	20	21	22
Fixed-Base LDGPS												
MCAF Camp Pendleton				1								
MCAF Kaneohe Bay					1							
MCAF Quantico				1								
NAF El Centro				1								
Avionics Upgrades												
AH-1Z				80	22	23	23	22	5			
AV-8B					59	59	58					
MV-22					125	52	52	52	46	27		
UH-1Y					30	7	17	17	17	16		

e. Tier 5. Tier 5 consists of TACAN Emulation ships, maritime associated aircraft updates, and fixed-base systems.

TIER 5 INSTALLATION SCHEDULE

FISCAL YEAR/LOCATION	11	12	13	14	15	16	17	18	19	20	21	22
Fixed-Base LDGPS												
NAS Brunswick						1						
NAS Jacksonville					1							
NAS Keflavik, Iceland												
NAS Key West							1					
JRB Willow Grove					1							
NS Rota, Spain												
TACAN Ship Systems												
AOE 6						1	1	1				
TAK/TAO/TAH/TAVB						8	8	8	7			
AD 41						7	7	7	7			
DDG 51						1	1					
LCC 19						1						
AS 39							1					
IX 514												
LSD						3	3	3	3			
AGF 3						1						
Avionics Upgrades												
C-130K/KC-130						18	19	19	15	15		
EP-3E						3	4	4	4			
NP-3						3	3	2	2			
P-3C						44	44	45	12			
T-45							35	35	35	35	35	
VH-3D				3	4	4						
VH-60N				3	3	2						
CN-235 ER						12	8	8	7			
Global Hawk					7							
HC-130H						6						

f. Tier 6. Tier 6 consists of follow-on procurement and installation of land based air wing aircraft, and associated fixed-base systems.

TIER 6 INSTALLATION SCHEDULE

FISCAL YEAR/LOCATION	11	12	13	14	15	16	17	18	19	20	21	22
Fixed-Base LDGPS												
NAS Corpus Christi						1						
NAS Kingsville							1					
NAS Meridian							1					
NAS Pensacola					1							
NAS Whiting Field South						1						
Avionics Upgrades												
C-9							5	5	5			
C-12							24	20	20	20		
C-20							7					
C-26							4	3				
C-35							4	3				
C-37							4	3				
C-40							4	3				
E-6B						4	4	4	4			
T-2							7	7	7	7		
T-6								13	15	15	15	15
T-34C							47	48	48	48	47	47
T-44							13	14	14	14		
TH-57							24	24	24	23	22	

g. Tier 7. Tier 7 consists of shipboard back-up systems.

TIER 7 INSTALLATION SCHEDULE

FISCAL YEAR/LOCATION	11	12	13	14	15	16	17	18	19	20	21	22
Shipboard Backup System												
CV/CVN							1	4	4	3		
LHA							1	1	2	1		
LHD							1	2	2	2		

2. Ready For Operational Use Schedule

a. Fixed-Base Local Differential Global Positioning System. The Fixed-Base LDGPS will be Ready For Operational Use (RFOU) upon completion of installation and certification.

b. Mobile Local Differential Global Positioning System. The Mobile LDGPS will be RFOU upon delivery.

c. Man Portable Local Differential Global Positioning System. The Man Portable LDGPS will be RFOU upon delivery.

d. Ship Relative Global Positioning System. The SRGPS will be RFOU upon completion of installation and certification.

e. TACAN Ship System. The TACAN Ship System will be RFOU upon completion of installation and certification.

f. Avionics Upgrades. Retrofit Avionics Upgrades will be RFOU upon completion of installation. New production aircraft will be RFOU upon delivery.

g. Shipboard Backup System. Shipboard Backup Systems will be RFOU upon completion of installation and certification.

3. Time Required to Install at Operational Sites. TBD.

4. Foreign Military Sales and Other Source Delivery Schedule. For information concerning Navy or Marine Corps involvement in FMS, contact PMA213.

5. Training Device and Technical Training Equipment Delivery Schedule

a. Training Devices. The following Training Devices (TD) will require modification to incorporate JPALS:

TRAINING DEVICES THAT REQUIRE JPALS MODIFICATION		
DEVICE NOMENCLATURE	**DEVICE NUMBER**	**QUANTITY**
Shore Based ATC Training System	15G31	1
Advanced Carrier ATC Training System	15G30	1
Amphibious ATC Training System	15G30	1
STARS AT Coach Proficiency Trainer	TBD	1
Landing Signal Officer Trainer	2H111	1
AV-8B Operational Flight Trainer	2F133	1
E-2C Operational Flight Trainer	2F110	2
E-6B Operational Flight Trainer	2F144A	2
EA-6B (ICAP II) Operational Flight Trainer/Navigation Trainer	2F143	2
F/A-18 Operational Flight Trainer	2F132	12
KC-130R Operational Flight Trainer	2F107	1
KC-130R Operational Flight Trainer	2F107A	1
KC-130T Operational Flight Trainer	2F152	1
MH-53E Operational Flight Trainer	2F141	1
MV-22 Operational Flight Trainer	2C71	4
P-3C Operational Flight Trainer	2F87(F)	6
P-3C Cockpit Procedures Trainer	2C41	3
P-3C Update III Mod Operational Flight Trainer	2F142A(F)	1
SH-60R Operational Flight Trainer	2F146	4
T-2C Operational Flight Trainer	2F101	10
T-6 Operational Flight Trainer	NA	14

TRAINING DEVICES THAT REQUIRE JPALS MODIFICATION		
DEVICE NOMENCLATURE	**DEVICE NUMBER**	**QUANTITY**
T-6 Instrument Flight Trainer	NA	26
T-6 Unit Training Device	NA	11
T-34C Cockpit Procedures Trainer	2C42	5
T-34C Flight Instrument Trainer	2B37	7
T-34C Navigational Flight Officer Trainer	2B37A	4
T-34C Flight Instrument and Navigation Flight Officer Trainer	2F37B	4
T-34C Pilot Familiarization Panel	2H110	5
T-44A Operational Flight Trainer	2F129	5
T-45A Instrument Flight Trainer	2F137	4
T-45A Operational Flight Trainer	2F138	9
TH-57B Cockpit Procedures Trainer	2C67	3
TH-57C Flight Instrument Trainer	2B42	4
UH-1 Low Cost Cockpit Procedures Trainer	2C71	1
Total		157

b. Technical Training Equipment. The qualitative and quantitative requirements for Technical Training Equipment (TTE) will be identified during JPALS test and evaluation and established during training analysis.

L. GOVERNMENT-FURNISHED EQUIPMENT AND CONTRACTOR-FURNISHED EQUIPMENT TRAINING REQUIREMENTS. NA

M. RELATED NTSPs AND OTHER APPLICABLE DOCUMENTS

DOCUMENT TITLE	DOCUMENT NUMBER	PDA CODE	STATUS
AH-1W Aircraft NTSP	N88-NTSP-A-50-8520E/D	PMA276	Draft Apr 03
C-130 Logistics Support Aircraft NTSP	N88-NTSP-R-50-9011B/A	PMA207	Approved Apr 99
Joint Training Systems Plan for the V-22 Osprey	N88-NTSP-A-50-8412E/D	PMA275	Draft Sep 03
Marine Corps Minimum Operating Strip System NTSP	N88-NTSP-A-50-9802/a	PMA251	Approved Nov 99
Aircraft Carrier Visual Landing Aid System NTSP	N88-NTSP-A-50-9202B/D	PMA251	Draft Aug 03
AN/SPN-46(V) ACLS NTSP Addendum One	N88-NTSP-E-50-8206E/A	PMA213	Approved Aug 00
Carrier Air Traffic Control Center Direct Altitude and Identification Readout (CATCC DAIR) and Amphibious Air Traffic Control Center Direct Altitude and Identification Readout (AATCC DAIR) Systems NTSP	N88-NTSP-E-50-8502C/P	PMA213	Proposed Jan 03
Air Capable Ship Visual Landing Aid System NTSP	N88-NTSP-A-50-9205B/P	PMA251	Proposed May 03
Amphibious Assault Ship Visual Landing Aid System NTSP	N88-NTSP-A-50-9203A/A	PMA251	Approved Jun 00
Marine Air Traffic Control and Landing Systems (MATCALS) NTSP	N88-NTSP-A-50-9804/A	PMA251	Approved Jul 00
CH-60S Multi-Mission Helicopter NTSP	N88-NTSP-A-50-9902/A	PMA276	Approved Aug 00
SH-60F Carrier Inner-Zone Anti-Submarine Helicopter NTSP	N88-NTSP-A-50-8508D/A	PMA276	Approved Aug 00

DOCUMENT TITLE	DOCUMENT NUMBER	PDA CODE	STATUS
S-3B Aircraft NTSP	N88-NTSP-A-50-8310E/D	PMA234	Draft Sep 03
MH-53 Helicopter NTSP	N88-NTSP-A-50-8417E/D	PMA276	Draft Feb 01
EA-6B Improved Capability Modification (ICAP) II & III Aircraft NTSP	N88-NTSP-A-50-7904E/D	PMA234	Draft Aug 03
EP-3E Airborne Reconnaissance Integrated Electronics Suite (ARIES) II Sensor System Improvement Program (SSIP) Aircraft NTSP	N88-NTSP-A-50-8605E/P	PMA290	Proposed Jun 03
CH-53D and CH-53E Aircraft NTSP	N88-NTSP-A-50-7604H/D	PMA276	Draft Sep 03
H-46 Helicopter NTSP	N88-NTSP-A-509-9409A/A	PMA276	Approved May 01
AN/SPN-35C Aircraft Control Approach Central NTSP	N88-NTSP-A-50-9908/A	PMA213	Approved Jul 02
National Airspace System Modernization Program (NAS Mod) NTSP	N88-NTSP-A-50-0011/A	PMA213	Approved Aug 01
AV-8B Harrier II Weapons System NTSP	N88-NTSP-A-50-8210E/D	PMA257	Draft Sep 03
C-40A Aircraft NTSP	N88-NTSP-A-50-9901/A	PMA207	Approved Oct 01
C9/DC9 Logistics Aircraft NTSP	N78-NTSP-A-50-0107A/D	PMA207	Draft Sep 03
VH-53D Helicopter NTSP	N88-NTSP-A-50-0007/A	PMA276	Approved Nov 01
VH-60N Helicopter NTSP	N88-NTSP-A-50-0008/A	PMA276	Approved Nov 01

DOCUMENT TITLE	DOCUMENT NUMBER	PDA CODE	STATUS
F/A-18 Aircraft NTSP	N88-NTSP-A-50-7703I/D	PMA265	Draft Oct 02
H-1 Upgrade Program (AH-1Z and UH-1Y) NTSP	N88-NTSP-A-50-9602A/P	PMA276	Proposed Dec 03
F-14A, F-14B, and F-14D Aircraft NTSP	N78-NTSP-A-50-8511D/D	PMA241	Draft Dec 03
H-60 Armed Helicopter Program NTSP	N88-NTSP-A-50-9805/A	PMA276	Approved Mar 02
Air Surveillance and Precision Approach Radar Control System NTSP	N88-NTSP-A-50-0006/A	PMA213	Approved Mar 02
Aviation Data Management and Control System (ADMACS) NTSP	N78-NTSP-A-50-000A/D	PMA251	Draft Jul 03
Strike Fighter Training Program NTSP	N88-NTSP-A-50-9906/A	JPO	Approved May 02
C-26D Aircraft NTSP	N78-NTSP-A-50-0118/A	PMA207	Approved Oct 02
C-130 Aircraft NTSP	N88-NTSP-A-50-0120/A	PMA207	Approved Oct 02
MH-60 Multi-Mission Helicopter NTSP	N88-NTSP-A-50-9902A/A	PMA276	Approved Jan 03
P-3C Aircraft NTSP	N78-NTSP-A-50-8112C/A	PMA290	Approved Apr 03
C-20D/G Aircraft NTSP	N78-NTSP-A-50-9306A/A	PMA207	Approved Apr 03
C-37A Aircraft NTSP	N78-NTSP-A-50-0119/A	PMA207	Approved May 03
E-6A/B TACAMO Aircraft NTSP Addendum One	N78-NTSP-A-50-8516E/A	PMA271	Approved Sep 03

DOCUMENT TITLE	DOCUMENT NUMBER	PDA CODE	STATUS
Marine Corps Shore Based and Expeditionary Airfield Aircraft Launch and Recovery Equipment NTSP	N78-NTSP-A-50-0122/A	PMA251	Approved Jul 03
E-2C Aircraft NTSP	N88-NTSP-A-50-8716E/A	PMA231	Approved Aug 03
C-2 Aircraft NTSP	N88-NTSP-A-50-8308C/A	PMA207	Approved Sep 03
AN/SSC-12 Shipboard Air Traffic Control Communications NTSP	N88-NTSP-A-50-0003/D	PMA213	Draft Aug 03

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